U.S. DEPARTMENT OF COMMERCE
National Telecommunications & Information Administration

Evaluation of the
Telecommunications and Information Infrastructure Assistance Program

Case Study Report

Regional Electronic Alternative Learning Center (REAL) 96012

Fairmont, West Virginia

Site Visitors:	Nicole Bartfai and Kyle Snow
Dates of Visit:	April 6-7, 1999

PREFACE

The following case study report is being issued as part of TIIAP's ongoing evaluation initiatives designed to learn about the effects of TIIAP funded projects. This report is one in a series of twelve based on in-depth case studies conducted in 1999 to study three subjects: (1) issues particular to rural communities (2) issues particular to urban communities, and (3) challenges in sustaining information technology-based projects. The case study reports give us evidence about the special challenges that each project faced and provide information for a better understanding of factors that can facilitate the success of such projects.

In addition to being urban or rural, the case study projects were selected because they involved distressed communities, represented innovative models for services, and affected measurable community outcomes. The case studies, conducted under contract by Westat, an independent research firm, consisted of extensive review of project files and records, interviews with project staff, representatives of partner organizations, and project end users. In addition to the 12 individual reports, a summary of findings across the projects is also available on the NTIA website.

NTIA wishes to thank the case study participants for their time and their willingness to share not only successes but also difficulties. Most of all, we applaud your pioneering efforts to bring the benefits of advanced telecommunications and information technologies to communities in need. We are excited about the case studies and the lessons they contain. We believe that these projects provide a unique insight into the variety of ways to eliminate "the digital divide" which exists in our nation. It is through the dissemination of these lessons that we can extend the dividends of TIIAP funded projects nationwide.

We hope you find this case study report valuable. You may obtain other case study reports, a summary of findings of the collected case studies, and other TIIAP publications through the NTIA website (www.ntia.doc.gov) or by calling the TIIAP office at (202) 482-2048. We also are interested in your feedback. If you have comments on this, or other reports, or suggestions on how TIIAP can better provide information on the results and lesson of its grants, please contact Francine E. Jefferson, Ph.D., at (202) 482-2048 or by email at fjefferson@ntia.doc.gov.

Stephen J. Downs, Director
Telecommunications and Information Infrastructure Assistance Program

Project Name	Regional Electronic Alternative Learning Center (REAL)
City/State	Fairmont, West Virginia
Grant Recipient	North Central Regional Education Service Agency (RESA VII)
OEAM Number	96012
Application Area	K-12 Education
TIIAP Grant Amount	$ 350,000
Match Amount	$ 477,857
Date of Site Visit	April 6-7, 1999
Site Visitor(s)	Nicole Bartfai, Kyle Snow
Abstract	The Regional Electronic Alternative Learning (REAL) Center was designed to provide two-way interactive instruction to a maximum of 20 students unable to remain in the traditional school environment. Students were referred to REAL because of health-related issues and discipline problems. Over the course of the 2-year grant period, Project REAL served 11 students (7 middle/high school students and 4 GED students) and an additional 3 since the grant period ended. The instructional facilitator taught students via videoconferencing once a day. The students were required by written contract to commit 20 hours a week, which included 5 hours on line and 15 hours of independent study, to the project. Outcomes for students varied, but overall most students experienced some level of success, and by the end of the 1998-99 school year, five students will have graduated through REAL. Throughout the project period, REAL staff were frustrated by the lack of referrals the project received from the counties, as well as the long delays experienced in connecting a student to the center via ISDN lines. The Regional Education Service Agency (RESA) indicated that difficulties in establishing connections, the limited commitment from district staff in terms of referrals, problems encountered when finding a contractor, and the administrative work associated with the grant contributed to the fact that project staff would not conduct a similar project. In general, the REAL Center demonstrated the feasibility of such an approach, but the number of obstacles encountered made the stability of the model difficult.

A. Background

Community Characteristics

The north central region of West Virginia is a diverse combination of rural and semi-urban communities. The center of the region is characterized by a corridor that stretches along I-79 from Morgantown through Fairmont to Clarksburg. These three mid-sized towns have the majority of elementary and secondary schools in the region. They also are home to two public universities. Outside, and even between, these more populated towns lie underdeveloped and rural areas. Mountains and valleys characterize the landscape, and many areas at one time were coal mining and farming communities. Over the past decade, most small schools in rural areas have been closed due to consolidation, and the students are now bused into larger towns. The one-room schoolhouse, once prevalent, no longer exists in rural West Virginia.

Project Overview

Problems/Disparities the Project Was Designed to Address. The Regional Electronic Alternative Learning (REAL) project was intended to target students in grades 7-12 who were no longer in school and were placed on homebound or home-based instruction. The target population included students who (1) were suspended or expelled, (2) had health-related problems, or (3) were teenage mothers and/or pregnant teenagers.

A major impetus for the project was that the number of suspended students was expected to increase dramatically in 1996 because West Virginia enacted the Safe Schools legislation mandating that students carrying a weapon of any kind would be automatically suspended for 1 full year. Regional Education Service Agency (RESA) staff, along with several superintendents, believed this new legislation would increase the number of students out of school on a long-term basis who therefore needed home-based instruction. As in homebound instruction, a county would have to supply teachers to transfer work back and forth between the student and school. The advantage of Project REAL is that it provides students with one-on-one instruction without having to go to their homes. This approach would reduce driving time to some remote locations and perhaps reduce problems that may develop when dealing with students placed on homebound due to behavior-related violations. Additionally, RESA staff felt that the one-on-one, interactive instruction they offered would be more effective than the traditional mode of delivering homebound instruction.

Although students out of school for violating the Safe Schools Act (SSA) were seen as the primary end users, other students that would benefit from such a program were teen mothers, students homebound due to health reasons, and students with psychological or emotional problems. As many as 100 students are on homebound instruction during any given semester in all 12 RESA VII districts, and some of these students have difficulties fitting into the traditional alternative education programs provided through the county.

Without a formal needs assessment conducted to inform the project, RESA staff used data regarding weapons violations in schools to estimate the number of students that would be on home-based instruction and in need of alternative education because of SSA (and thereby eligible for the REAL Center project). They relied on the Kids Count Data Book for the number of reported incidents and they spoke with an attendance officer from one of the counties. From September to March during the 1995-96 school year, 44 of the 55 West Virginia counties reported incidents involving weapons. In those counties, 194 incidents involving 141 students in grades 7-12 were reported. Prior to the SSA, 57 (29 percent) such incidents resulted in expulsions. Under SSA all those students would be expelled, more than doubling the number of students in home-based/alternative instruction programs.

Technical Approach. The project was designed to provide two-way interactive videoconferencing capabilities so a teacher would be able to provide face-to-face instruction to one or more students simultaneously. The project anticipated serving a maximum of 20 students during any given semester. Students would be placed in groups of one to five per class session and would be offered the core academic subjects: math, science, social studies, and language arts. Due to the unforeseen problems (discussed in Section D), only 11 students were admitted into REAL and all instruction was conducted one on one.

REAL Center staff worked with district-level staff to establish a procedure for admitting students to the REAL Center. All 12 counties were invited to be active participants in the development of the referral and implementation criteria, but participation varied among districts. REAL Center staff anticipated that county officials, with approval from superintendents, would refer homebound or home-based students that met an established criterion. Often the attendance officer, a homebound placement officer, or a guidance counselor would initiate the referral process by submitting paperwork to the REAL Center. To determine eligibility, the county official, along with the instructional facilitator from RESA, conducted a home visit and looked at the student's record. Two factors determined eligibility: the student was expected to meet certain

criteria (e.g., fifth-grade reading level) and to have a supportive home environment. Without parental support, students were refused admittance into REAL.

The main server is housed in the RESA VII center and equipped with a video conferencing system that includes a card set and network termination unit, a camera presenter system, a document stand, and standard software. The server has multi-point and point-to-point instruction capabilities, which allow 16 different locations to be connected at once, if needed. Computer workstations in student homes included a Pentium PC with 1.5 GB hard drive, 14" monitor, video conferencing card set with onboard modem, keyboard, mouse, and either a 12x or 24x CD-ROM drive. The teacher station was similar to the students' computers except it had a 2.5 GB hard drive and a 17" monitor. The teacher station used a document stand and a remote control camera to better provide instruction. All stations had Microsoft Office 97 in addition to basic skill software. These two systems were connected through ISDN service, allowing real-time, face-to-face video and audio, document sharing, and Internet access.

Anticipated Outcomes. At any given time, Project REAL anticipated serving 20 students. These students were expected to benefit from the face-to-face instruction while remaining on pace with the rest of their class. These students would be receiving quality instruction in a small group setting using the project's video conferencing equipment. An additional benefit for them would be interaction with other students, which typically is infrequent among homebound students. Project staff anticipated this approach would be better than traditional homebound instruction because of the increased level of interaction with the teacher and other students. Project staff also believed this approach would improve or result in a student's ability to return to the traditional classroom on pace with his or her classmates.

Expanding the project to include secondary users was another anticipated outcome. It was originally planned that each county would install and maintain a computer at a central location. This computer would be connected to the main computer at RESA VII in Fairmont and would be used to provide staff development for teachers, adult education and literacy classes, summer school classes, and other training activities. Other expansion possibilities included the Wood Technology Center, which would use the system to deliver further training to employees through a distance education model.

The majority of outcomes anticipated by the project can be more generally viewed as project implementation milestones rather than clearly stated student outcomes (e.g., better grades and graduating on time). These milestones included:

- establishing the physical environment from which to teach,
- filling the staff positions,
- training the instructional facilitator,
- establishing county implementation guidelines,
- identifying and enrolling students,
- installing PC units into students' homes,
- providing instruction via two-way interactive video, and
- providing support services via two-way interactive video.

Project Status at the Time of the Site Visit. Over the 2 years of the project, 11 students were instructed via video conferencing. At the time of the site visit, the project was serving five students, two of whom were seniors, in their second year of the program, and planning to graduate in May. The other three students were new to the program for the 1998-99 academic year. One was a sixth grader with cancer who is hoping to advance to seventh grade. The second was a student suffering from social phobia. The most recent addition was a seventh grader suspended for taking a gun to school. The instructional facilitator indicated he had the potential to make it through the program and return to school next year.

Technically, RESA is currently operating solely on the more limited point-to-point instructional system because the monthly service cost associated with keeping the multi-point system operational (i.e., telephone lines) was not justified when students were being serviced on a one-to-one basis. The multi-point capability is available in the system, should it be needed in the future.

B. Community Involvement

Characteristics of the Grant Recipient Organization

The North Central Regional Education Service Agency (RESA VII) works with 12 counties to provide education-related services. As stated in their annual report, "the priority of the

agency is to respond to those cooperative special needs as they are identified." The agency has 22 service areas that assist public and private K-12 schools and institutions of higher education. Service areas include job training and development, adult basic education, after-school services, youth health issues, school legal services, training, and staff development issues. Besides providing services, RESA is also the data bank for all student records and state education data.

There are eight regional centers throughout the state. RESA VII is the largest, covering 5,000 square miles in 12 counties and serving approximately 58,000 students and 4,200 professional educators in 161 public schools and approximately 1,600 students in private schools. It has the largest full-time staff and encompasses the largest area of the eight regional centers. A 25-member board of directors governs the agency through monthly meetings. The funding for RESA VII is a combination of state, local, and federal money. Sources include both federal block and competitive grants with the majority of the money coming from the State Department of Education block grants. RESA started as a volunteer organization in 1968, and in 1972 it was legislated as a service agency to provide assistance to schools in a predefined region. RESA depends on the cooperation of the county superintendents, boards of education, teachers, school personnel, and other clients such as adult education programs to use its programs and/or services.

RESA staff commented that TIIAP was the first large, competitive federal grant the agency had received. The key project staff members were RESA employees, several of whom had worked on submitting the grant. The executive director and project director worked closely together to administer the project. The instructional facilitator shouldered a large portion of the day-to-day activities involved in the project. She was responsible for conducting home visits, providing instruction, planning lessons, providing computer training, operating the system, and working with school and county officials. The technician on the project assisted in maintaining the server and the equipment at RESA.

Partnerships

Prior to submitting the grant, RESA met with county superintendents and other regional associations to gather support. Many pledged their support of the REAL project and indicated they would be interested in using such a system to serve their students, but none of the listed partners were asked to supply matching funds at the onset of the grant. Membership in RESA is mandatory for all counties, but participation in specific RESA-related initiatives is voluntary. This presented a unique problem for RESA in getting counties to use REAL. For

example, counties that were interested in using the system were expected to pay the daily fee to maintain the ISDN connection to the homes for the period of time the student was enrolled. Therefore, many counties with limited resources did not request the REAL Center services**.** Although the reasons that individual counties did not engage the REAL Center cannot really be known, one superintendent we spoke with suggested that it was likely to be a combination of budgetary constraints and a resistance to the technology. Only 5 of the 12 counties referred students, and only 4 were able to connect their students. The fifth county was served by a different telephone service provider that could not connect ISDN lines to the student's location (unlike the provider in the other counties). If a county did not refer a student, or the student did not meet the selection criteria, the county made no monetary contribution.

In the original grant proposal, other partners included the Wood Technology Center in Randolph County, Community Initiatives in Technology Information and Learning (CITIL), and West Virginia Adult Basic Education. Many wrote letters of support that indicated they would be interesting in establishing locations equipped with a computer and ISDN connections in order to provide face-to-face interaction and instruction. These partnerships were established to reach a secondary population and were made on the assumption the partners would find funding for their system and computers.

Project REAL was only used by one of the initial partners. The West Virginia Televised Adult Basic Education program in Huntington provides closed-circuit course offerings for students unwilling or unable to leave the home for adult basic education. After hearing about Project REAL, the center director gathered information about students who would be potential candidates in the north central region and applied for a state ABE grant. Through the grant, four students working on their GED received face-to-face instruction via REAL for a 3-month trial period.

Community Outreach

Involving Community Stakeholders. RESA commented that in order for counties (potential partners) to use the REAL services, they would need to be involved in the development of REAL. After the grant was awarded and the technical aspects were in the process of being established, RESA assembled an advisory board for the REAL project. The Regional Advisory Committee included superintendents, special education officers, attendance officers, media specialists, and juvenile judges. They met to discuss the policies and procedures surrounding

selection criteria, formal agreements with students and parents, establishment of remote sites, and expansion of the project to potential secondary users.

One of the most important contributions of the Regional Advisory Committee was the development of the criteria used to select the students who would participate in the project. During advisory meetings, members developed the "Criteria for Success," which outlined the basic requirements for students before being admitted into the program. The criteria stated that each student must have at least a fifth-grade reading level, parental support, the ability to work independently, and a willingness to commit a minimum of 20 hours a week to the program.

Project Outreach. The project tried several ways to advertise the REAL Center to county officials that would be referring potential end users. The project director and instructional facilitator demonstrated the project at several superintendents' meetings and at RESA advisory board meetings in order to display the powerful nature of the two-way video conferencing. A promotional brochure describing the project was developed and distributed widely at technology fairs and conferences throughout the state. REAL was displayed on the RESA website (www.resavii.wvlink.com) in order to advertise the program and its intended purpose. A newspaper story announced the TIIAP grant award and detailed the project and its goals. It should be noted that because RESA is a service agency, the nature of its outreach is somewhat limited to making possible users aware of the service without being able to compel them to participate. Additionally, efforts at publicity were primarily top-down, focusing on superintendents, rather than bottom-up, focusing on students and teachers. This approach was a result of a decision by the Regional Advisory Committee, which wanted the control of referrals to be at the discretion of the county.[1] Finally, the project has prepared an "Administrator's Handbook," which may serve as a resource for similar projects in the future.

Training. The instructional facilitator had extensive experience in working with students in alternative education situations, but she required training in the technical aspects associated with working the two-way interactive system. This training included LotusNotes (application software), Net Nanny (protective software to filter objectionable websites), and V-C Wizard (scheduling software). One of the project goals was to train her to use the software and to teach her about integrating technology and web-based instruction in order to maximize the system. Both the instructional facilitator and project director attended sessions at an education summit in

[1] This decision was not necessarily the vision of the RESA Center staff. They wanted the information available to all principals and other school personnel.

Delaware on teaching via the World Wide Web, audio/visual tools, and techniques for distance learning.

After students were identified and initial home visits were completed, the technical assistant installed the computer while the instructional facilitator met with parents and students to discuss project expectations and answer questions and concerns. Later, the instructional facilitator provided training on how to use the computer (this often occurred before the necessary ISDN lines had been installed). Each student was also given a manual. Many of the public school students were familiar with how to use the computer and therefore required little training. The GED students had no previous computer experiences and were more apprehensive about using the computer. They required more in-depth and ongoing training on how to use a computer and the system. This proved to be the most challenging of training experiences.

Protecting Privacy. RESA VII developed a Network Security Plan to protect the privacy of the students enrolled in the REAL program. The best way to protect student privacy was to make sure the network system that supported the two-way interactive video did not store any personal or sensitive data. Student data including grades were stored on the West Virginia Education Information System, a closed network connecting schools and districts throughout the 12 county region.

C. Evaluation and Dissemination

Evaluation

The REAL Center had a formal evaluation plan in place at the beginning of the project. The project director, the director of RESA, and the instructional facilitator prepared the plan and the Regional Advisory Committee reviewed it. Although the project had not allocated money from the budget for an outside evaluator, a graduate student in the Education Department at West Virginia University had agreed to perform an evaluation of the project. However, after the first year of the project, the student had finished her dissertation and was offered a job elsewhere. At that time, the project was still working to get students connected, and identifying a replacement evaluator was not a priority. In the end, the instructional facilitator performed the final evaluation.

The evaluation had four elements: (1) accountability matrix, (2) REAL Center Advisory Committee checklist, (3) student survey, and (4) parent survey. The accountability matrix was completed by four RESA staff members central to the REAL Center: the RESA director, the REAL Center director, the REAL Center technician, and the instructional facilitator. The matrix listed the 10 project objectives and their related milestones and asked respondents to rate whether the project's objectives had been met to a point below their expectations, at their expectations, or above their expectations. The REAL Center Advisory Committee checklist was similar to the accountability matrix, asking respondents to judge whether or not each of the 10 objectives had been achieved by the end of the project. There was also room for open-ended responses and for comments regarding the REAL Center.

Findings from the accountability matrix indicated an overall sense that all of the project goals were met. However, the REAL Center Advisory Committee findings indicate varying levels of success of implementing the project goals. Findings showed that all committee members felt RESA demonstrated the feasibility of the REAL system, and seven of the eight respondents felt they successfully implemented an alternative form of homebound instruction. Again, all indicated that RESA worked with county personnel to develop appropriate guidelines for the project, but only seven felt they collaborated with county personnel to identify and enroll students as well as in carrying out the requirements necessary for students to receive credit. The area that received the lowest rating of successful completion (four of seven said so) was in expanding the system to include secondary users (e.g., Wood Technology students and teachers seeking professional development).

Student and parent surveys served as indexes of user satisfaction. Surveys were completed by four parents, four homebound students, and four adult education students. The questionnaires were structured so that students rated aspects of the program on a five-point scale (1= lowest satisfaction and 5 = most satisfaction). The vast majority of the responses were a "4" or "5," indicating high satisfaction. Respondents were then asked to endorse a number of proposed changes, all of which concerned the delivery of instruction (e.g., have a different instructor for each class or use the Internet more often). Given the high level of satisfaction with the program, few changes were endorsed by students or parents.

Another reporting mechanism that was not part of the formal evaluation plan or final evaluation report, but that provided useful and practical information for project staff, was the extensive contact log for each student. Each log contained student assignments and work, lessons,

and notes about the student's general well-being. They provided a rich history of each student's individual experience, allowing the instructor to note changes in performance over time without being constrained by a grade or number. Staff also knew the current educational status of each participating student. For example, two students of the REAL Center had graduated in spring 1998 and two additional students will graduate in 1999. During the 2-year period, some participating students had attempted to return to the traditional classroom and continued there, and some had attempted to return to school but were again placed on homebound instruction through the REAL Center.

Despite the fact that the evaluation report followed the evaluation plan, the site visit team identified several weaknesses that could be overcome in future evaluation efforts. First, the accountability matrix provides a wealth of information, but it is not clear what level of expectation each respondent had for each objective. Because the data are based upon a comparison between expectations and perceived performance, any failure to meet expectations may be due to poor performance or expectations that are too high, while any objective that exceeded expectations may have been due to high performance or low expectations. For example, in this project the technical objectives may have been perceived differently by the technician than by the project director. Second, nearly all of the data were collected at the end of the project in order to prepare the final evaluation report. Although the data could have been utilized as formative data, guiding the development of the project, they instead were summative only. The project missed an opportunity to adapt, especially in response to student and teacher feedback via the user satisfaction surveys. It should be noted, however, that although formal data were not used to guide the development of the project, the instructional facilitator did frequently ask for feedback from students and parents throughout the project, and incorporated it when possible.

Dissemination

Information about the REAL Center was disseminated to other potential projects, both statewide and nationally, through several means. First, the REAL Center was linked from the RESA website (resavii.wvlink.com), but it is unknown how many hits the page received. Second, the project was presented at the Association for Educational Computing and Technology conference in February 1998. The RESA director also presented the project to members of the House and Senate Education Committees of the West Virginia Legislature.

D. Problems Encountered

Partners/Stakeholders

In the proposal, individual school districts were described as partnering with RESA when students were referred to the REAL Center. The county's contribution was to install ISDN lines to a student's home and pay the monthly service fee. RESA recognized their dependence on counties to make REAL a success and, therefore, RESA tried to actively involve counties in the REAL development and implementation. Although the project appeared to have support from the counties in the application, few students were referred to project REAL. Several reasons contributed to the low student referral rates from potential partners:

- There were concerns over the cost of using the service, especially because many districts used state money to develop alternative after-school programs.
- Districts wanted to "wait and see" how successful REAL was before using the service.
- Other districts did not feel students such as SSA violators deserved special accommodations.
- RESA is a service agency and employees embrace that philosophy. Counties are not required to participate in RESA's projects and consequently, RESA waits for counties to request their services.

Despite any support or effort to include counties in the planning it was difficult to force or expect a county to participate in a voluntary program especially given the other issues surrounding utilization of the service.

Planning/Administrative

Although the grant was awarded in October 1996, a contractor for the equipment was not named until April 1997, and the first student did not receive instruction via video conferencing until December 1997. Thus, delays at the beginning of the project resulted in not servicing students during the spring semester of the 1996-97 school year.

RESA had a pre-bidder's meeting to discuss necessary components of the RFP. All support and maintenance to the system was cut out of the RFP due to the reduction in grant size by $150,000. Project staff indicated that it would have been useful to receive greater direction from TIIAP in two areas: budget and best practices for navigating the RFP process. The first

RFP went to 25 potential bidders, but only 5 responded. Project staff decided not to accept any of the first bids, but instead used the first round as a learning experience to issue a second, more detailed RFP. After careful consideration, they reluctantly gave the contract to the lowest bidder. RESA had reservations because this contractor had little previous experience and may not wield the same political influence as other potential providers but their bid was significantly lower than other bids.

This process not only caused delays in establishing the system, but it resulted in changes to the video conferencing system. The successful bidder installed a video conferencing system that was different from the project director's original choice, in that most of the equipment was assembled from various manufacturers. Although the contractor met all contractual agreements, it has been difficult for REAL to receive technical support on the system, especially now that the contractor is no longer providing contractual services for installing video conferencing equipment.

Technology

Establishing telecommunication service (ISDN lines) is an ongoing problem for the project. Two telecommunication companies service the 12 counties in the RESA area, and RESA has experienced problems with both. One is a large regional provider and the other is a small company serving a small portion of West Virginia. Both presented unique issues for RESA.

RESA relied heavily on the cooperation of the leading telephone company in the region, which currently holds the state contract for phone and other communication lines in the state. RESA requested the following:

- dedicated PRI lines for the multi-point and point-to-point connections,
- installation of the ISDN lines to the RESA building in Fairmont, and
- installation of ISDN connections for the individual students' homes.

Discussions between the grant recipient and the communications provider led RESA to believe that obtaining PRI lines from Clarksburg would not be a problem and could be accomplished within a reasonable time period. When the official request was made to the telephone company, RESA was told it would be 6 months, which would cause additional delays in installing the equipment. RESA searched for a mechanism to accelerate the process. They asked for and received assistance from the Office of Administration at the State Government, which is responsible for state contracts for telecommunication. After 2 months, the Office of Administration successfully negotiated with the phone company for 2 PRI lines for Project REAL. These delays ultimately affected the type of individuals who were referred to the project. Because the connection process could take as little as 2 months or as long as 6 months, students who were considered short-term users (e.g., teen mothers) were not ideal. The delay in establishing service has resulted in only long-term placements (i.e., students who will be out of school for no less than 6 months) entering the REAL program.

Higher telecommunications costs in some regions prevented the use of ISDN lines. Accommodations were made for the one student that was referred in this area to go to a relative's house, which was located in the other service area, in order to receive instruction through REAL. Before the system was operational, this student was serviced through an analogue system, but the project staff felt this type of video connection was unacceptable due to difficulties in video and audio transmission.

End Users

Low referral rates also affected the project. Only five students received instruction during the spring or fall semester. Project staff indicated several possible reasons why so few students were involved in REAL:

- **High cost in enrolling students.** Project staff felt students were not referred due to the cost associated with having a student in the REAL program. The county was responsible for paying a daily fee, which subsidized communication costs. RESA paid costs at their end, which included long distance charges and instructional charges. It cost counties that referred students approximately $3,600 per student for a full school year of instruction.[2] The superintendent that was interviewed felt that cost was not an issue for his county but may have been for other counties. He understood the extensive nature of instruction, especially when compared to traditional homebound instruction. He felt the cost was justified.

- **Political pressures surrounding the targeted population.** The population being targeted by this grant was students who were suspended from school due to SSA violation. Since submitting the proposal, districts were forced to change how they planned to approach these students. Previously, students expelled from school were to receive alternative education that was to be paid for by parents. However, two state court rulings stated that these students should receive alternative services at the expense of the districts. The state provided block grants to the districts to help cover the costs. Furthermore, the state discouraged the use of the REAL Center and as a result, most districts employed a staff person to offer alternative education in an out-of-school setting.[3]

- **Perception of students expelled due to SSA violation.** Most of the REAL students were referred due to illness or disease and not a result of SSA violation. This was due to community pressures and beliefs about how those student should be treated. One county official indicated that students who violate school rules by bringing a weapon to school do not deserve educational opportunities that regular students do not receive; therefore it was difficult for counties to justify spending additional money on students who had been suspended. Some counties attempted to refer expelled students. Two were refused entry into the project due to non-supportive home environments, one started in the program but was later removed from the home and placed in a reform school, and the most recent SSA violator started in REAL in March.

- **Lack of comfort with new technology.** One district superintendent who utilized REAL suggested that some districts were simply not accustomed to technology. He noted that to him, the new technology was exciting, but to others, it may be seen more skeptically, even suspiciously.

- **County instability, staff displacement, and territorial issues.** Counties have a full-time homebound teacher. Utilizing this system may cause staff displacement. One county that used the system and fully supported the project speculated that the system might not have been fully utilized by other counties due to high turnover in superintendents causing increasing instability. Also, since it was "not my idea" many county officials did not buy into the REAL project.

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[2] This calculation is based on an average provided by project staff of $20 a day per student. It was calculated with 20 instructional days in a month and 9 months in a school year.

C. Project Outcomes

Impact on End Users

Outcomes centered around two assumptions: (1) there would be a need for alternative methods of delivery because of the increase in the number of students on homebound instruction due to SSA violation, and (2) counties would refer this surplus of students to REAL. The anticipated demand for an alternative technology-oriented method of instruction did not meet expectations and, therefore, referrals were limited to 11 students during the grant period.

During the grant period, Project REAL provided 36 credit hours to seven middle/high school students and four GED students. After the grant period, three additional students and two return students receive instruction. Attitudes surrounding the project and possible impact were documented in the evaluation report and discussed during interviews with the instructional facilitator, parents, and students during the site visit.

The evaluation report discussed students' and parents' level of satisfaction with REAL as measured by a satisfaction survey. Most students and parents indicated that the services offered through the REAL program were above average.[4] The questionnaire also asked students and parents to indicate whether specified services should be changed. In most service areas, the majority of respondents indicated no changes were necessary except for two service areas, "give daily class grade" and "buy more instructional software programs." Almost half of respondents indicated that each change was necessary. The fewest number of respondents said no change was necessary in using the Internet more often," which was misleading because most students in REAL were unable to establish Internet connection due to technical problems not solved by the telecommunication provider upon installing the ISDN connection.

RESA also gathered data relating to the students' grade point averages before entering the program and while in the program. The combined average GPA before enrollment was 1.59; during enrollment, the combined average GPA was 2.58. Thus, an increase of .99 out of

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[3] Possible reasons for discouraging the use of REAL was the innovative nature of the technology and the fact that another program in the state had previously attempted a distance learning model that was unsuccessful because of the limited use of technology.

[4] A total of four students, four parents, and four GED students responded to the user satisfaction survey.

a possible 4.0 was achieved. Possible reasons for this increase are improved attendance for these students, intense one-on-one instruction, more flexibility in students' schedules, or differences in teacher expectations when assessing student performance. Determining the reasons for the difference is difficult, at best, due to the numerous variables associated with the students' learning.

The targeted population of end users was students who were suspended from school for violating the 1996 SSA. Due to previously discussed issues surrounding these students, they were not the primary beneficiaries of the project. Instead, most of the end users were students diagnosed with physical or psychological illnesses. Positive outcomes were seen for most students. For example, during the first year, two of the five students enrolled in the project received their high school diplomas. Another student, who was fighting Crohn's disease, has returned to school on track with the rest of the class. This year, a sixth-grade student with cancer has been able to continue his schooling through REAL and should move on to seventh grade.

Two students have been enrolled in REAL for the past 2 years. During the site visit, we had an opportunity to talk with one student and her parents, as well as the other student's mother. Their stories follow:

- Student 1 was diagnosed with Crohn's disease several years ago. Despite her illness, she is preparing to graduate in May with the rest of her class. After continually missing school, she was put on homebound instruction but she was told she would be unable to graduate with a certified high school diploma under the traditional homebound environment. Through traditional homebound instruction, students can only receive instruction in the four core subjects, but one must have electives and physical education credits to graduate. This was unacceptable for the student and her parents. Their search for alternative methods of instruction that met all the graduation requirements led them to the REAL project. Originally, the project did offer only the four main subjects, but the instructional facilitator was willing to work with students in other subject areas. She felt she would be able to adequately teach the additional subject areas due to the low number of students being served. This would allow students to receive the needed elective and physical education credits. Now, the student plans to attend a local college in the fall. She still battles the disease and is unsure if she will be able to handle a full-time class load.

- Student 2 suffers from social phobia. The incidence of social phobia in teenagers is growing due to pressures many experience at school.[5] This student does not feel comfortable in the school or classrooms because he experiences panic attacks when around people. Since starting high school, his grades steadily declined. During his 10th-grade year, he missed school so frequently that he was failing several courses. The attendance officer in the county referred him to REAL. With a doctor's recommendation and support from his parents, he

[5] During the site visit, a counselor working with students with social phobia spoke about the increasing numbers of students with social phobia and the reasons for such an increase.

enrolled in the program and has found a learning environment where he is able to function and experience success. Since entering REAL over a year ago, his grades have risen to As and Bs. Also, REAL forces him to interact with the instructional facilitator. This interaction is viewed as important because he engages in human contact outside the home. During an interview, his mother said he likes the program. He will graduate in May.

Although each student's story was unique, most shared a common element—each student was productive and hard working with pre-established goals before entering REAL. For most students enrolled in REAL, the challenges they faced were medical or psychological in nature. REAL made school easier and therefore made learning enjoyable for these students that otherwise may not have achieved their current level of success.

Several students, for a variety of reasons, dropped out of the program. One of the first students enrolled in the program has since dropped out of school. After a successful year enrolled in the program, she no longer had a doctor's excuse for remaining on homebound and was forced to return to school. Before the school year started, she withdrew with her father's permission and has not returned to finish high school. Another student, who was referred to the program after being suspended, was removed from the home and sent to reform school. He remains at the reform school and continues to demonstrate behavior problems.

Impact on Secondary End Users

Four GED students were provided an opportunity to participate in the REAL project for 3 months. Previously, they received GED course instruction through televised courses and a technical assistance line for homework and other questions. These students not only benefited from the face-to-face interaction but also from the opportunity to learn about and work on a computer. The director of the Televised Adult Basic Education program conducted a satisfaction survey of the four GED students after the 3-month pilot period. All the students enjoyed the subjects they studied through the computer program, but only one of them felt they learned better through the video conferencing rather than through the closed-circuit programming.

It is important to note that although RESA had anticipated serving more secondary end users, the ability to do so was based upon the assumption that other groups would find grant support for the services to be provided. RESA took this assumption to heart, providing support for other groups' applications for grants. In more than one quarterly report, project staff mention working with partners to write grants that will allow REAL to be extended to secondary users. None of these grants were funded and, therefore, additional resources were not used to reach this secondary population.

Impact on Other Beneficiaries

Two preservice education students from Fairmont State College joined the instructional facilitator to help provide math instruction during the spring semester in 1998. The students benefited from the REAL program by having an opportunity to work closely with an experienced teacher and by learning to use the technology. The REAL Center also benefited from the teacher education students. The students provided input into ways to improve the instruction that were not previously addressed. They recommended using an electronic pen to write on the screen like a chalkboard. This approach was not completely successful, but it triggered a successful solution. Due to the video conferencing software, the instructional facilitator was able to switch to a second camera. This camera could be devoted to a sheet of paper on which the instructor could write things down and work with the students to solve problems or to a microscope to be attached for live demonstrations.

Impact on Grant Recipient and Project Partners

The impact on the grant recipient and possible partners was minimal. The REAL project grant prompted the grant recipient to apply for other grants. RESA VII took the initiative to find grants that will help them service the counties. They have received 10 state or federal grants over the past 3 years, including one from the National Endowment for the Humanities. There was no impact on partners or the relationship between the partners and the grant recipient. Project REAL is a small component of the education-related services RESA provides counties, and the relationships have been built on years of working together.

Replication

Project staff mentioned they had received several phone calls, e-mails, and face-to-face inquiries about Project REAL, but they were not familiar with any project similar to REAL. Most inquiries looking to replicate this approach expressed concern over the cost associated with a similar approach.

F. Sustainability and Project Expansion

The project has sustained approximately the same level of activity as during the grant period. Project staff plan to continue providing REAL services to students and counties interested in using the service. Part of the reason for this sustainability is that the start-up costs of equipment were provided for in the TIIAP grant, and counties pay the costs of connecting students as they are identified. Now that the hardware is purchased and in place at RESA, the only costs associated with continuing the project are the instructor's salary and maintenance costs.

Programmatic changes will happen next year, as the instructional facilitator will be taking on a different role in July. She will be responsible for professional development in the 12-county region. This staff change may affect project REAL in two ways:

- The system may be expanded to include teachers and professional development activities. This was originally proposed in an effort to reach a secondary population, but it might be more realistic in the next year with the changing of staff roles.
- The role of instructional facilitator may be filled in a different way. One possibility mentioned during the site visit is to contract with substitutes or homebound teachers in the counties on a subject-level basis or to contract with Fairmont State's teacher education program so college students can provide more subject-specific instruction prior to student teaching.

Other expansion possibilities include using REAL to address a new state mandate requiring 6 weeks of foreign language in all elementary and middle schools in the state and also the school-to-work program. This expansion might allow RESA to use the multi-point capabilities not previously used.

Before making plans for next year, project staff are waiting on an initiative to install an ATM backbone throughout the state. If this becomes a reality, the REAL system will be incompatible with the state system. Staff also expressed concern that their system may not be Y2K compliant.

G. Lessons Learned and Recommendations for Other Communities

Project staff felt the REAL Center was extremely beneficial to students able to use the service but they recognized the project was not cost effective. REAL project staff felt this project could be replicated more cost effectively under different conditions. These conditions would involve having the following:

- **Established ISDN lines through most if not all of the community.** Although there are some advanced telecommunications in the north central region of West Virginia, they do not extend to all parts of the region. In order to reduce the cost associated with installation, having some ISDN lines through all, or even parts of the service area would be beneficial.

- **More commitment from county superintendents and county personnel.** As stated earlier, an increase of students on homebound instruction was evident, but a commitment to using the system must also be established. Garnering support from the county officials, responsible for referring homebound students, as well as from superintendents is essential to establish end users.

- **One set of predetermined curriculum guidelines instead of using each county's guidelines.** The four counties that used the REAL Center had different curriculum requirements. In order for the instructional facilitator to teach students in different counties, she was forced to create different lessons plans, activities, etc., so that the requirements of each county could be met.

- **Fewer budgetary constrictions.** The amount requested in the original grant proposal budget was not awarded. This resulted in a revised plan that RESA staff felt hindered project implementation.

Under these conditions, a project similar to the REAL Center might be more productive but other institutions need to consider the following lessons about planning, implementation, and technology:

Confirm the Need. As stated earlier, RESA did not conduct a needs assessment of all 12 counties. The limited research they conducted did not get at the question, "would the system be used?" The counties did experience an increased number of students out of school because of violating the SSA legislation, but they rarely referred these students to the REAL program. Many provided traditional home-based instruction or opened alternative schools during after-school hours. The counties found more cost-effective ways to handle the increased number of students especially given the extra money provided by the state to establish after-school alternative learning sites. Unfortunately for RESA, this decision came after the grant was awarded. Conducting a

formal assessment as to who would actually use the system might assist other projects trying to implement a similar project.

One-on-One Video Conferencing Is Effective, But Not Necessarily Cost Effective. The mode of delivery was believed to be far superior to traditional homebound instruction, but the cost associated with getting the system installed in the home was problematic. Some of the cost was due to the rural nature of the project. Cost implications might not be as prevalent in more urban areas because many telecommunication lines already exist. The success in the method of delivery also hinges on the ability of the instructional facilitator to connect with the students. It was evident when talking with parents, students, and others involved in the project that the instructional facilitator was key to the student's success. She developed a relationship with each of the students more like a mentor than a teacher. She was described as "making them feel like they can succeed." She also explained how she approaches the role: "It is about teaching to the students not about teaching the subject."

Research Potential Equipment and Contractors. The pre-bidders meeting prior to sending out an RFP was educational and provided useful information but sending out a Request for Information (RFI) might have been more useful. Be sure to include more technology questions concerning the future of technology and the upgrading of the system. In selecting a vendor, try to find someone that will assume a vested interest in the project. If vendors have a reputation that will benefit from such a project, they will work to promote and advertise the project.

Obtain Support From Local and State Government and School Officials. RESA obtained support for the project but when implementation meant school districts were required to pay for each student, it was more difficult to get users. More universal support and promotion might have increased the project's success.

Obtain Support From Staff Responsible for Implementing Key Tasks. Gaining the support of superintendents was important, but students were usually referred by school or county officials. Although the Regional Advisory Committee requested RESA limit referrals to the county level, focusing publicity and advertisement of the project at principals, teachers, guidance counselors, and county officials (e.g., attendance officers) may produce more enthusiasm within the schools and result in more referrals for projects.

Obtain Local Phone Company Support. Invite the phone company to initial proposal or project development meetings and attempt to include them as partners. RESA

attempted to include phone companies in the grant application process but neither company provided assistance. If the phone company is willing to become involved in the effort, it might give them a stake in the success of the project. Another approach is to develop written agreements as to the scope of work and the time frame in which to accomplish each task.

Work With Students Before the System Becomes Operational in the Homes, Especially if There Are Likely to Be Delays. Try to establish a rapport with the student by getting the computer into the home and teaching the student how to use it. If the connection is not established, try to find a method for exchanging work via e-mail, phone, or regular mail.

H. Summary and Conclusion

Project REAL provided two-way interactive video instruction to students who were unable to remain in a traditional school environment. Although the targeted population was initially identified as being students suspended from school due to weapons violations, most REAL referrals were students with medical problems (e.g., cancer and Crohn's disease). The change in scope from the original population was a result of a state-level court decision that stated schools were responsible for providing suspended students with alternative methods of instruction. Districts felt the REAL approach would be more costly than other potential solutions and therefore did not refer these students to REAL. Another contributing factor was that some district personnel believed that students suspended from school did not deserve the advantages associated with the REAL approach, further reducing those types of referrals.

REAL students received daily one-on-one instruction in multiple subjects with the instructional facilitator and were contractually committed to additional hours of independent study. Several students experienced success through this approach. The individual students' stories (e.g., graduating from high school or being able to return to school at pace with the rest of the class) demonstrated the potential for this type of technological approach. Unfortunately, obstacles encountered during the project resulted in only 7 secondary students receiving instruction during the grant period. This was a result of three key factors: (1) difficulties in establishing telecommunication connections in a hard-to-serve area, (2) limited commitment from frontline personnel (i.e., school districts), and (3) changing political environment surrounding the targeted population. Each factor contributed to the less than expected number of students referred to the REAL program.

Project REAL demonstrated the feasibility of using such an approach (real-time interactive video) to work one-on-one with students unable to remain in a traditional school environment. However, given the nature of the grant recipient—RESA, a service agency—and the difficulties encountered during project implementation, it is difficult to determine whether this approach could effectively be replicated in other hard-to-serve areas. If this approach were to be replicated, a formal feasibility assessment would be recommended in order to determine: (1) who should be the intended population, (2) who would be responsible for referring students, and (3) the current condition/limitations of telecommunications in the area. Determining this type of information would significantly improve the likelihood that a project could maximize use of the two-way interactive video approach to educate students unable to function in a traditional school environment.